

## DEFINITIONS AND SPECIAL INSTRUCTIONS

## 1. Scope of Survey

This survey covers all companies engaged in the manufacture of complete antifriction bearings and components, including balls and rollers, in the United States. Plain bearings are not collected on this survey.

## 2. Figures to be reported

Companies with more than one establishment manufacturing the products covered by this survey are requested to complete a separate report form for each location. If you have not received a separate form for each of your establishments, please call the contact listed on the report form or write to the U.S. Census Bureau for additional forms.

## a. Quantity and value of shipments

The figures on quantity and value of shipments should include the physical shipments of all products sold, transferred to other establishments within your company, or shipped on consignment, whether for domestic or export sale. The value represents the net sales price, f.o.b. plant, to the customers or branch to which the products are shipped, net of discounts, allowances, freight charges, and returns. Shipments to your own branches should be assigned the same value as comparable sales to unaffiliated customers; i.e., the value includes an appropriate allocation of company overhead and profit. Products bought and resold without further manufacture should not be included in shipments.

## b. Columnar structure of report

When posting your figures to the original report, please be sure to report information in the correct columns. These are:

*Column 1* — Quantity of shipments (domestic and export)

*Column 2* — Value of shipments (\$1,000) (domestic and export)

*Column 3* — Quantity produced for all purposes includes total quantity of balls and rollers produced in thousands of units, whether shipped or produced and consumed at the same establishment.

## 3. Definitions

**ANTIFRICTION BEARINGS** — Bearings using rolling elements, i.e., balls or rollers. Plain bearings, i.e., those with no rolling elements, are not to be included.

**BALL BEARINGS, COMPLETE, UNMOUNTED** — Antifriction bearings using balls as rolling elements.

**Annular ball bearings** — Antifriction bearings primarily designed to support load perpendicular to shaft axis. More commonly called "radial" ball bearings.

**Ground or precision ball bearings** — Excludes all unground ball bearings.

**Single-Row Conrad Ball Bearings** — Deep groove ball bearings with only one row of balls and a cage (i.e., retainer, separator). Included are all standard and special types, all inner race configurations (extended, wide, etc.) and all outer race configurations (spherical O.D., cylindrical O.D., wide, etc.)

**MINIATURE BALL BEARINGS** — Ball bearings with outside diameter below, but not including, 3/8" or 9mm O.D.

*ABEC 1 and ABEC 3* — The "regular" standards of ground ball bearings precision. (item code 2101)

*ABEC 5 and up* — The higher, or "precision" standards of ground ball bearings precision. (item code 2102)

*Single-row maximum capacity type* distinguished from the conrad type by a filling slot in both outer and inner rings which allows the bearings to contain a greater number of larger balls than the corresponding conrad bearings without filling slots. Also known as "max" type or "full complement" or "filling slot" ball bearings. (item code 2114)

*Integral shaft and integral spindle ball bearings* — Have a solid inner race, i.e., a shaft, which has the ball raceway(s) ground into the shaft surface, thus making the inner race/shaft integral to the bearings. Examples include, but are not restricted to, water pump bearings, some automotive hub units, and computer spindle bearings. (item code 2118)

*Double row ball bearings* — Unitary bearings with two rows of balls. Includes both angular contact and deep groove types, and both conrad and max types. All ABEC 1 and up

**3. Definitions — Continued**

of all standard and special configurations are to be included, but self-aligning double row ball bearings should not be included. (item code 2120)

*Angular contact ball bearings* — Have a single row of balls whose internal clearances and ball race locations are such as to result in a definite contact angle and predetermined relationship of inner to outer ring faces. All standard and special configurations and all ABEC 1 and up precisions are included. (item codes 2121 and 2123)

*All other ground or precision bearings (ABEC 1 and up)* — This category should include only those ground ball bearings, etc., which cannot be classified above. (item code 2124)

*Ground ball bearings of less than ABEC 1 precision* — All types of radial (single-row, double-row, angular contact, other) ball bearings which have ground raceways but are less than the ABEC 1 precision grade. (item code 2126)

*Unground (less than ABEC 1)* — Antifriction ball bearings with unground raceways. All radial types, styles and configurations should be included. (item code 2128)

*Thrust ball bearings* — Concentric axial loading only, both ground (less than ABEC 1 and up) and unground types, of all configurations. Both single direction thrust and double direction thrust ball bearings are to be included. Do not include angular contact bearings. (item codes 2133 and 2135)

*Linear ball bearings* — Ball bearings designed for linear relative motion between its raceways in the direction of rolling.

*Other ball bearings* — Those which do not qualify under any of the previous categories. This category should only include those bearings which cannot be classified above. (item code 2155)

**Tapered roller bearings, including cups and cones, unmounted** — Antifriction bearings using taper-shaped rollers as rolling elements.

*Cup and cone assemblies shipped as a set* — This is a complete tapered roller bearing, which includes the cup and cone and roller assembly, each of which may be sold separately. (item code 2232)

*Cups shipped separately* — Tapered bearing outer races. (item code 2233)

*Cone assemblies shipped separately* — Tapered bearing inner race, with cage and rollers. (item code 2234)

*Cylindrical roller bearings* — Antifriction bearings using cylindrical shaped rollers as the rolling elements. Axes of rollers are parallel to the bearing axis. Regular (ABEC 1 and 3) and precision (ABEC 5 and up) are reported separately, but within each category all types and configurations should be included; single-row and multi-row, radial and thrust, traction motor, journal, aeroengine, and others, except those classified as needle roller bearings, as defined below. (item codes 2311 and 2312)

*Spherical roller bearings* — Self-aligning antifriction bearings using convex (spherical, or barrel-shaped or concave hourglass shaped) rollers as the rolling elements. Within each category of single-row and double-row types, all configurations of radial and thrust, and all precisions should be included: geared outer, spherangular, air frame, and all other similar types. (item codes 2324 and 2325)

*Needle roller bearings* — Antifriction bearings using “needle” rollers as the rolling elements. Needle rollers are cylindrical shaped but are long and slim, with a uniform diameter not exceeding 5mm and having a length of at least three times the diameter. The ends of the rollers may be of several shapes. (item code 2341)

*Linear roller bearings* — Roller bearings designed for linear relative motion between its raceways in the direction of rolling. (item code 2351)

*Other roller bearings, n.e.c.* — This category should only include those roller bearings not classified above. (item code 2393)

*Mounted bearings (except plain)* — Antifriction ball or roller bearings which are encased (mounted) in an enclosure (a mounting, or housing, or housing closure) usually made of iron, steel, or rubber. The enclosure, or housing, may be of a one-piece unit or two-piece (split) construction. Major types included are pillow blocks, flange units, takeup units, rubber tired bearings, and any other types of mounted bearings. Loose bearing inserts sold separately are not to be included here, but should be included in appropriate bearing categories above. (item codes 2417–2455)

**Parts and components for ball and roller bearings (except cups and cones) including balls and rollers sold separately** — as described in the following:

*Balls* — Ball bearing type steel balls of all grades

**3. Definitions — Continued**

*Shipments* — Should include the physical shipments of all products sold, transferred to other establishments within your company, or shipped on consignment, whether for domestic or export sale.

*Production* — For all purposes, both for internal production of bearings or other products, and for external shipments, (item code 2911)

*Other antifriction ball bearing component and parts, including unassembled ball bearings, cages, races, seals, shields, etc.* No bearings are to be placed in this category. (item code 2921)

*Rollers* — Roller bearing typed steel rollers of all grades

*Shipments* — Should include the physical shipments of all products sold, transferred to other establishments within your company, or shipped on consignment, whether for domestic or export sale.

*Production* — For all purposes, both for internal production of bearings and other products, and for external shipments. (item code 2931)

*Other roller bearing parts and components, (except rollers)* Examples include, but are not restricted to seals and shields. Also, no bearings are to be placed in this category. (item codes 2942–2953)

*Housings and parts and components for housings* — Includes housing closures, collars, spacers, sleeves, adapters, and other miscellaneous items. (item code 2959)

**NOTE:** Bearing types such as rod ends and cam followers/ track rollers should be placed in the appropriate bearing category such as single row deep groove conrad type, spherical roller, cylindrical roller, etc.

**4. Comparability**

Data reported in this survey should correspond to data reported in the Economic Census - Manufacturing Sector form. The sum of values for item codes shown in column (a) should correspond to the dollar values reported under product codes indicated in column (b) below:

Current Industrial Reports (Form MA332Q)	Economic Census - Manufacturing Sector
Item codes (a)	Product codes (b)
2101 through 2155	3329911 100
2232 through 2234	3329913 100
2311 through 2393	3329915 100
2417 through 2455	3329917 100
2911 through 2959	3329919 100

**REFERENCE LIST — Continued**

FORM <b>MA332Q</b>		
<b>ANTIFRICTION BEARINGS (SHIPMENTS)</b>		
Product code	Item code	Item description
		<b>BALL BEARINGS, COMPLETE, UNMOUNTED</b>
		<b>Annular, include self-aligning</b>
		Ground or precision
		Single-row conrad
		Miniature (below 9mm. O.D.)
3329911001	<b>2101</b>	Regular (ABEC 1 and 3)
3329911002	<b>2102</b>	Precision (ABEC 5 and up)
		Other regular (ABEC 1 and 3)
3329911003	<b>2103</b>	9mm. O.D. thru 30mm. O.D.
3329911004	<b>2104</b>	Over 30mm. O.D. thru 52mm. O.D.
3329911005	<b>2105</b>	Over 52mm. O.D. thru 100mm. O.D.
3329911007	<b>2107</b>	Over 100 mm. O. D.
		Other Precision (ABEC 5 and up)
3329911009	<b>2109</b>	9mm. O.D. thru 30mm. O.D.
3329911011	<b>2111</b>	Over 30mm. O.D. thru 52mm. O.D.
3329911012	<b>2112</b>	Over 52mm. O.D. thru 100mm. O.D.
3329911013	<b>2113</b>	Over 100 mm. O. D.
3329911014	<b>2114</b>	Single-row maximum capacity type
3329911018	<b>2118</b>	Integral shaft and integral spindle ball bearings
3329911020	<b>2120</b>	Double-row
		Angular contact
3329911019	<b>2121</b>	Regular
3329911023	<b>2123</b>	Precision
3329911024	<b>2124</b>	All other ground or precision bearings (ABEC 1 and up)
3329911027	<b>2126</b>	Ground bearings of less than ABEC 1 precision
3329911029	<b>2128</b>	Unground (less than ABEC 1)
		<b>Thrust ball bearings</b>
3329911033	<b>2133</b>	Ground
3329911035	<b>2135</b>	Unground
3329911055	<b>2155</b>	<b>Other ball bearings</b>
3329911000	<b>2199</b>	<b>TOTAL, complete, unmounted ball bearings (Sum of item codes 2101–2155)</b>
		<b>TAPERED ROLLER BEARINGS, INCLUDING CUPS AND CONES, UNMOUNTED</b>
3329913032	<b>2232</b>	Cup and cone assemblies shipped as a set
3329913033	<b>2233</b>	Cups shipped separately
3329913034	<b>2234</b>	Cone assemblies shipped separately
3329913000	<b>2299</b>	<b>TOTAL, tapered roller bearings, including cups and cones, unmounted (Sum of item codes 2232–2234)</b>

# REFERENCE LIST — Continued

FORM <b>MA332Q</b>		
Product code	Item code	Item description
		<b>ROLLER BEARINGS (EXCEPT TAPERED), UNMOUNTED</b>
3329915011	<b>2311</b>	<b>Cylindrical roller bearings</b>
3329915012	<b>2312</b>	Regular (ABEC 1 and 3) Precision (ABEC 5 and up)
		<b>Spherical roller bearings, including hourglass and barrel</b>
3329915024	<b>2324</b>	Single-row
3329915025	<b>2325</b>	Double-row
3329915041	<b>2341</b>	<b>Needle roller bearings</b>
3329915093	<b>2393</b>	<b>Other roller bearings, n.e.c.</b>
3329915000	<b>2399</b>	<b>TOTAL, roller bearings, (except tapered), unmounted</b> <i>(Sum of item codes 2311–2393)</i>
		<b>MOUNTED BEARINGS (EXCEPT PLAIN)</b>
3329917017	<b>2417</b>	Ball bearings, unit and/or split mounted
		Roller
3329917053	<b>2453</b>	Unit-mounted
3329917055	<b>2455</b>	Split-mounted
3329917000	<b>2499</b>	<b>TOTAL, mounted bearings (except plain)</b> <i>(Sum of item codes 2417–2455)</i>
		<b>PARTS AND COMPONENTS FOR BALL AND ROLLER BEARINGS (EXCEPT CUPS AND CONES), INCLUDING BALLS AND ROLLERS SOLD SEPARATELY</b>
3329919011	<b>2911</b>	Balls (thousands of units)
3329919021	<b>2921</b>	Other antifriction ball bearing components and parts, including unassembled ball bearings, cages, races, seals, shields, etc. (except balls)
3329919031	<b>2931</b>	Rollers (thousands of units)
		Other roller bearing parts and components (except rollers)
3329919035	<b>2942</b>	For tapered roller bearings (except cup and cone assemblies)
3329919036	<b>2944</b>	For cylindrical roller bearings
3329919037	<b>2946</b>	For spherical roller bearings
3329919049	<b>2953</b>	For other roller bearings
3329919059	<b>2959</b>	Housings and parts and components for housings, including housing closures, collars, spacers, sleeves, adapters, and other miscellaneous items
3329919000	<b>2999</b>	<b>TOTAL, parts and components for ball and roller bearing (except cups and cones), including balls and rollers sold separately</b> <i>(Sum of item codes 2911–2959)</i>

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